Physical activity as an aid for smoking cessation - PHASMO study

David Faeh, MD
Christiane Ruffieux, PhD
Jacques Cornuz, MD, MPH

Background

• Prevalence of smoking in Switzerland: 33%
• Most smokers cumulate both risk behaviors, i.e., smoking and sedentarity.
• Prevalence of sedentary lifestyle is higher among smokers than non smokers.
• Levels of physical activity inversely related to smoking rates
Gradient of sedentary lifestyle among Swiss smokers (2002)

Working Hypothesis

- Including a tailored moderate-intensity physical activity intervention in a standard smoking cessation treatment program (pharmaceutical treatment and counseling) increases the chances of quitting and reduces nicotine withdrawal symptoms, negative moods, perceived stress, and weight gain.
Specific aims

• **Main objective**: to determine whether a tailored physical activity intervention involving moderate-intensity exercise is an added value to a standard smoking cessation intervention in terms of likelihood of smoking abstinence.

• **Secondary objectives**
  – to determine whether this intervention prevents weight gain, reduces withdrawal symptoms, stress and improve mood and self-confidence in quitting
  – to assess the effect of this intervention on lipids profile, body composition and leptin concentration.

Methods

• Randomized controlled trial of 560 sedentary adults regular smokers recruited from the community (lay press) (Cochrane library)

• Allocated into one of the two groups (intervention group vs. control group) during a 10-week period and 2 follow-up visits (6, 12 months follow-up).

• All subjects (intervention and control groups) participate in a smoking cessation program composed of a pharmacological treatment (nicotine replacement therapy: patch and/or an inhaler) and individual counseling (Onkologie 2002, Annals Intern Med 2002).
Intervention

- The intervention group will attend the 10-week physical activity program blending moderate-intensity exercise and lifestyle physical activity and the control group a 10-week health education program to ensure equal contact condition.

Study population: Inclusion criteria

- Current daily smoker ≥10 or more cigarettes per day
- Having smoked (on average ≥ 10 cigarettes/day) regularly for at least 3 years
- Age between 18 and 65 years
- Sedentary lifestyle defined as less than 20 minutes a day of moderate-intensity physical assessed by the Swiss Baseline Questionnaire.
Exclusion criteria

• Current pharmacological agent use to quit smoking
• Medical problems that would alter training responses (arthritis, orthopedic problems)
• Presence of an unstable medical condition
• Current or recent major cardiovascular event
• Current psychiatric illness, substance abuse
• Current or planned pregnancy
• Systematic skin disease

Preliminary analysis: AIMS

1. To compare Cardiovascular Disease Risk (CVD-risk) profile between heavy smokers and regular smokers
2. To examine the hypothesis that CVD-risk is associated with number of daily smoked cigarettes
3. To assess the impact of waist circumference on CVD-risk in heavy smokers
Criteria for being at risk for cardiovascular disease (CVD)*

1. Triglycerides ≥ 2.0 mmol/l
2. LDL-cholesterol ≥ 4.0 mmol/l
3. HDL-cholesterol ≤ 1.0 mmol/l
4. Mean blood pressure** ≥ 100 mm Hg

Definition for being at risk for CVD:
When meeting 2 or more criteria

** DBP+(SBP-DBP)/3

Definition of “heavy smokers”

• heavy smokers = upper tertile of number of daily smoked cigarettes

• Only data of first 215 male smokers here presented

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Participants characteristics

- Mean (± SD) age: **42.2 years** (± 9.4)
- Mean (± SD) number of daily smoked cig.: **29.4** (± 11.2)
- 67 (31%) heavy smokers: **35 to 70** cigarettes
- Mean (± SD) Fagerström score: **5.8** (± 2.3)
- Mean previous quit attempts: **2.8**
- 92 (43%) at CVD-risk
- Mean (± SD) BMI: **25.0 kg/m2** (± 3.6)
- Mean waist circ. (± SD): **87.5 cm** (± 9.8)

CVD-risk by categories of daily smoked cigarettes

Chi² p-value 0.06
CVD-risk by categories of daily smoked cigarettes

![Bar chart showing CVD-risk by categories of daily smoked cigarettes.](chart1)

- 34% for 10-22 daily smoked cigarettes
- 42% for 22.5-30 daily smoked cigarettes
- 52% for 35-70 daily smoked cigarettes

Age of heavy smokers versus regular smokers

![Box plot comparing age of heavy smokers versus regular smokers.](chart2)

- T-test p-value: 0.02
BMI of heavy smokers versus regular smokers

T-test p-value 0.05

Waist circumference of heavy smokers versus regular smokers

T-test p-value 0.002
CVD-risk profil by waist circumference and number of smoked cigarettes

The stratification for waist circumference strongly attenuates the association between being a heavy smoker and at risk for CVD (not statistically sign.)

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Odds Ratio for CVD-risk*

<table>
<thead>
<tr>
<th>HND smokers vs. Regular smokers</th>
<th>95% CI</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>no adj</td>
<td>1.74</td>
<td>215</td>
</tr>
<tr>
<td>adj for age</td>
<td>1.46</td>
<td>215</td>
</tr>
<tr>
<td>adj for BMI</td>
<td>1.44</td>
<td>211</td>
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<tr>
<td>adj for waist circ.</td>
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<td>211</td>
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<tr>
<td>adj for BMI &amp; waist</td>
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<td>211</td>
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<tr>
<td>adj for Age, waist &amp;BMI</td>
<td>1.06</td>
<td>211</td>
</tr>
</tbody>
</table>

*CI [15-35%]  **CI [13-50%]  ***CI [44-69%]  ****CI [49-80%]

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Limitations

• Cross-sectional data

• Surrogate dependant variable (CVD-risk)

• Only men

Conclusions

• In male smokers, association of being heavy smoker and being at risk for CVD was close to significance (p=0.06).
  – Thus, even among smokers, CVD-risk appears to increase with number of cigarettes

• After adjustment for waist circumference, BMI and age, associations diminished and were not significant anymore
Conclusions

• Adjustment of waist circumference had a stronger impact on CVD-risk of heavy smokers than adjustment for BMI and age.
  – This result supports the hypothesis that CVD-risk of heavy smokers might be mediated by waist circumference.
  – Other studies show, that smoking changes body composition by increasing visceral adipose tissue and that increased waist circumference may mediate CVD-risk of smokers *


Acknowledgements

• R. Bize, MD
• R. Stoianov, RN
• B. Marti, MD MPH
• L. Tappy, MD
• F. Paccaud, MD
• V. Girardet, « allez-hop »
• J.-L. Gilliéron, Lausanne University Sports center
• And all others health care professionals involved in the PHASMO study